

Europäisches Patentamt
European Patent Office
Office européen des brevets



(11) EP 0 747 943 A3

(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
18.02.1998 Bulletin 1998/08

(51) Int. Cl.⁶: H01L 21/56

(43) Date of publication A2:
11.12.1996 Bulletin 1996/50

(21) Application number: 96303045.7

(22) Date of filing: 30.04.1996

(84) Designated Contracting States:
DE FR GB IT NL

(30) Priority: 02.05.1995 US 434336

(71) Applicant:
TEXAS INSTRUMENTS INCORPORATED
Dallas, Texas 75243 (US)

- Bednarz, George A.
Plano, TX 75023 (US)
- Chee, Tay Liang,
c/o Texas Instruments Inc.
Dallas, TX 75243 (US)
- Lim, Julius,
c/o Texas Instruments Inc.
Dallas, TX 75243 (US)

(72) Inventors:
• Bolanos, Mario A.
Plano, TX 75023 (US)
• Libres, Jeremias L.
Dallas, TX 75243 (US)

(74) Representative: Holt, Michael
Texas Instruments Limited,
Kempton Point,
68 Staines Road West
Sunbury-on-Thames, Middlesex TW16 7AX (GB)

(54) **Improvements in or relating to integrated circuits**

(57) A method and apparatus for encapsulating an integrated circuit die and leadframe assembly. A pre-packaged sproutless mold compound insert 71 is placed in a rectangular receptacle 91 in a bottom mold chase 81. The receptacle is coupled to a plurality of die cavities 85 by runners 87. Leadframe strip assemblies containing leadframes, integrated circuit dies, and bond wires coupling the leadframes and dies are placed over the bottom mold chase 81 such that the integrated circuit dies are each centered over a bottom mold die cavity 85. A top mold chase 90 is placed over the bottom mold chase 81 and the mold compound package 71. The top mold chase 90 has die cavities 95 corresponding to those in the bottom mold chase 81. The mold compound insert 71 is preferably packaged in a plastic film 75 which has heat sealed edges 77. The mold compound is forced through the package 75 and heat seals 77 during the molding process by the pressure applied by a rectangular plunger 101. The sproutless mold compound insert is packaged so that the mold compound will exit the packaging only where runners intersect the receptacle. The sproutless mold compound insert requires no alignment or cutting tools within the mold station. The plunger is applied using variable speed and pressure to control the rate the mold compound fills the cavities in the top and bottom mold chases, thereby avoiding voids in the completed packages and minimiz-

ing wire sweep of the bond wires of the integrated circuit assemblies.

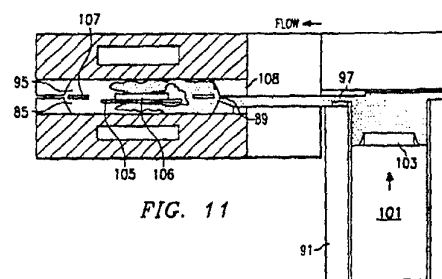


FIG. 11

EP 0 747 943 A3

EP 0 747 943 A3



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 96 30 3045

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	US 5 043 199 A (KUBOTA AKIHIRO ET AL)	1,2,4,5,9-12,14,15,17,19	H01L21/56
A	* column 5, line 3 - column 6, line 9; figures 5A-5C,6 *		
X	PATENT ABSTRACTS OF JAPAN vol. 015, no. 003 (E-1019), 7 January 1991 & JP 02 260438 A (NITTO DENKO CORP), 23 October 1990,	1,2,9	
A	* abstract *	19	
D,A	US 5 098 626 A (PAS IRENEUS J T M) * column 5, line 4 - line 27; figure 5 *	1,9	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			H01L
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 19 December 1997	Examiner Zeisler, P
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

EPO FORM 1503 (03/82) (P4/C01)